Parapierrotite $Tl(Sb,As)_5S_8$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As terminated crystals, to 1 cm, prismatic along [001], with prominent {100}, {110}, and {100}.

Physical Properties: Hardness = 2.5–3 VHN = n.d. D(meas.) = 5.07 D(calc.) = 5.04

Optical Properties: Opaque. *Color:* Black; white with a creamy tint in reflected light, with rare red-purple internal reflections. *Luster:* Semimetallic. *Pleochroism:* Weak in air, grayish white to brownish gray in oil. *Anisotropism:* Distinct, brownish gray to bluish gray.
R_1–R_2: (400) 33.1–35.1, (420) 33.1–34.4, (440) 33.1–33.7, (460) 32.1–33.1, (480) 31.6–32.6, (500) 31.0–32.3, (520) 30.5–31.9, (540) 30.0–31.5, (560) 29.5–31.1, (580) 28.9–30.6, (600) 28.4–30.2, (620) 28.0–29.8, (640) 27.6–29.5, (660) 27.2–29.0, (680) 26.1–28.5, (700) 26.4–28.4

Cell Data: *Space Group:* $P2_1/n$. $a = 8.098(5)$ $b = 19.415(12)$ $c = 9.059(6)$ $\beta = 91.96(8)^\circ$ $Z = 4$

X-ray Powder Pattern: Alšar, Macedonia.
3.493 (100), 2.832 (100), 4.15 (90), 3.696 (90), 2.913 (90), 2.356 (90), 3.599 (70)

Chemistry:

	(1)	(2)	(3)
Tl	19.3	19.4	20.2
Sb	50.8	51.8	50.8
As	5.3	5.0	3.7
S	24.7	25.4	24.5
Total	100.1	101.6	99.2

(1–3) Alšar, Macedonia; by electron microprobe, the average corresponding to $Tl_{1.01}(Sb_{4.36}As_{0.64})_{\Sigma=5.00}S_{8.01}$.

Polymorphism & Series: Dimorphous with pierrotite.

Occurrence: Of hydrothermal origin, in cavities in realgar (Alšar, Macedonia).

Association: Realgar (Alšar, Macedonia); avicennite (Lookout Pass, Utah, USA).

Distribution: From Alšar (Allchar), near Rošden, Macedonia [TL]. At the Jas Roux deposit, 10 km east of Chapelle-en-Valgaudemar, Hautes-Alpes, France. In the Hemlo gold deposit, Thunder Bay district, Ontario, Canada. From near Lookout Pass, Tooele Co., Utah, USA.

Name: For its relation to pierrotite.

Type Material: National School of Mines, Paris, France.

References: (1) Johan, Z., P. Picot, J. Hak, and M. Kvaček (1975) La parapierrotite, un nouveau minéral thallifère d'Allchar (Yougoslavie). Tschermaks Mineral. Petrog. Mitt., 22, 200–210 (in French with English abs.). (2) (1976) Amer. Mineral., 61, 504 (abs. ref. 1). (3) Engle, P. (1980) Die Kristallstruktur von synthetischem Parapierrotit, $TlSb_5S_8$. Zeits. Krist., 151, 203–216 (in German with English abs.). (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 415.